

**IN THE CLAIMS:**

Claim 1. (Currently Amended) An instrumented prosthetic foot for use with an actuated leg prosthesis controlled by a controller, the instrumented prosthetic foot comprising:

an elongated body having a top and a bottom part;

a connector to connect the instrumented prosthetic foot to the leg prosthesis; and

a pair of sensors interposed between the connector and the top part of the elongated body and positioned side by side, the pair of sensors being configured to measure the pressure force on the connector;

wherein the connector is mounted to the top part of the elongated body via only by way of the pair of sensors.

Claim 2. (Previously Presented) An instrumented prosthetic foot according to claim 1, wherein:

the bottom part of the elongated body includes a pair of basic underfoot locations, the first region corresponding to the heel area of the human foot and second region corresponding to the toe area of the human foot.

Claim 3. (Previously Presented) An instrumented prosthetic foot according to claim 2, wherein:

a sensor of the pair of sensors is associated with each basic underfoot locations of the elongated body.

Claim 4. (Withdrawn) An instrumented prosthetic foot according to claim 3, wherein:

the sensors include a strain sensor to measure the strain applied at a corresponding basic underfoot location of the ground engaging member.

Claim 5. (Withdrawn) An instrumented prosthetic foot according to claim 3, wherein:

the sensors include a pressure sensor to measure the pressure applied at a corresponding basic underfoot location of the ground engaging member.

Claim 6. (Previously Presented) An instrumented prosthetic foot according to claim 3, wherein:

the sensors associated with each basic underfoot locations of the elongated body are load cells.

Claim 7. (Withdrawn) An instrumented prosthetic foot according to claim 3, wherein:

the sensors are positioned under the ground engaging member.

Claim 8. (Withdrawn) An instrumented prosthetic foot according to claim 3, wherein:

the sensors are positioned between the ground engaging member and the elongated body.

Claim 9. (Cancelled)

Claim 10. (Withdrawn) An instrumented prosthetic foot according to claim 5, wherein:

the pressure sensor is a force-sensing resistor.

Claim 11. (Withdrawn) An instrumented prosthetic foot according to claim 5, wherein:

a rigid plate placed on at least one side of the sensor.

Claim 12. (Withdrawn) An instrumented prosthetic foot according to claim 11, wherein:

a resilient pad covering the rigid plate and the sensor.

Claim 13. (Withdrawn) An instrumented prosthetic foot according to claim 1, wherein:

an ankle structure pivotally connecting the elongated body to the connector.

Claim 14. (Withdrawn) An instrumented prosthetic foot according to claim 13, wherein:

at least two sensors are provided, the sensors including two load cells positioned between the connector and the ankle structure.

Claim 15. (Withdrawn) An instrumented prosthetic foot according to claim 13, wherein:

at least two sensors are provided, the sensors including an optical encoder and a load cell, the optical encoder being positioned on the ankle structure about its pivot axis with the elongated body and the load cell being positioned between the ankle structure and the connector.

Claim 16. (Previously Presented) An instrumented prosthetic foot according to claim 1, wherein:

the pair of sensors transmits signals to the controller using a wired connection.

Claim 17. (Previously Presented) An instrumented prosthetic foot according to claim 1, wherein:

the pair of sensors transmits signals to the controller using a wireless connection.

Claim 18. (original) An instrumented prosthetic foot according to claim 1, wherein:

the connector removably connects the instrumented prosthetic foot to the leg prosthesis.

Claim 19. (Currently Amended) An instrumented prosthetic foot according to claim 3, wherein:

a first sensor of the pair of sensors being slightly biased towards the heel region of the elongated body and a second sensor of the pair of sensors being slightly biased towards the toe region of the elongated body.

Claim 20. (Withdrawn) An instrumented prosthetic foot according to claim 1, wherein:

the pair of sensors transmits signals to the controller using an optical interface.

Claim 21. (Previously Presented) An instrumented prosthetic foot according to claim 1, wherein:

the pair of sensors includes a load cell.

Claim 22. (Withdrawn) An instrumented prosthetic foot according to claim 1, wherein:

the pair of sensors includes a strain gauge.

Claim 23. (Withdrawn) An instrumented prosthetic foot according to claim 1, wherein:

the pair of sensors includes a pressure sensor.

Claim 24. (Withdrawn) An instrumented prosthetic foot according to claim 1, wherein:

the pair of sensors includes a force sensing resistor.

Claim 25. (Withdrawn) An instrumented prosthetic foot system for use with an actuated leg prosthesis, the system comprising

an instrumented foot comprising an elongated body having a top and a bottom part and a toe and a heel region; a connector to connect the instrumented prosthetic foot to the leg prosthesis; and a pair of sensors interposed between the connector and the elongated body top part for measuring the pressure force on the connector, and

a controller for receiving data relative to the pressure force on the connector from the pair of sensors and for determining the torque between the elongated body top part and the connector using the received data.

Claim 26. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the controller further determines the pressure force on the toe and the heel region of the elongated body using the received data.

Claim 27. (Withdrawn) An instrumented prosthetic foot system according to claim 26, wherein:

a first sensor of the pair of sensors being biased towards the heel region of the elongated body and a second sensor of the pair of sensors being biased towards the toe region of the elongated body.

Claim 28. (Withdrawn) An instrumented prosthetic foot system according to claim 27, wherein the controller determines the torque via the following equation:

$$M = F_{\text{HEEL}} \cdot L_{\text{S\_HEEL}} - F_{\text{TOE}} \cdot L_{\text{S\_TOE}};$$

where

$F_{\text{HEEL}}$  is the data relative to the pressure force measured by the first sensor of the pair of sensors;

$L_{\text{S\_HEEL}}$  is the distance between the center of the connector and the center of the first sensor of the pair of sensors;

$F_{\text{TOE}}$  is the data relative to the pressure force measured by the second sensor of the pair of sensors; and

$L_{\text{S\_TOE}}$  is the distance between the center of the connector and the center of the second sensor of the pair of sensors.

Claim 29. (Withdrawn) An instrumented prosthetic foot system according to claim 28, wherein the controller determines the pressure force on the toe and the heel region of the elongated body via the following equation:

$$F_{\text{TOE}} = (M + ((F_{\text{S1}} + F_{\text{S2}}) \cdot L_{\text{HEEL}})) / (L_{\text{HEEL}} + L_{\text{TOE}});$$

$$F_{\text{HEEL}} = (-M + ((F_{\text{S1}} + F_{\text{S2}}) \cdot L_{\text{TOE}})) / (L_{\text{HEEL}} + L_{\text{TOE}});$$

where

$F_{\text{TOE}}$  is the pressure force on the toe region of the elongated body;

$F_{HEEL}$  is the pressure force on the heel region of the elongated body;

$M$  is the torque;

$L_{TOE}$  is the distance between the center of the connector and the center of the toe region; and

$L_{HEEL}$  is the distance between the center of the connector and the center of the heel region.

Claim 30. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the pair of sensors transmits signals to the controller using a wired connection.

Claim 31. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the pair of sensors transmits signals to the controller using a wireless connection.

Claim 32. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the connector removably connects the instrumented prosthetic foot to the leg prosthesis.

Claim 33. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the pair of sensors transmits signals to the controller using an optical interface.

Claim 34. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the pair of sensors includes a load cell.

Claim 35. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the pair of sensors includes a strain gauge.

Claim 36. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the pair of sensors includes a pressure sensor.

Claim 37. (Withdrawn) An instrumented prosthetic foot system according to claim 25, wherein:

the pair of sensors a force sensing resistor.